Delivering Diabetes Education Over the Internet: I. Factors in Patient Acceptance

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INTRODUCTION

Computer-based patient education is a promising area of interest in health informatics. Increasing use and access to the Internet and its resources suggest significant opportunities for patient education and disease management. However, realizing this potential is highly dependent on the interaction between the information seeker and the computer resource. Although it is undeniable that use of the Internet is growing rapidly, many individuals have no, or very limited, access to the Internet and little experience with computers. Internet appliances (devices designed for simplicity of use and functionality limited to Internet access and electronic messaging) have recently appeared in an attempt to facilitate Internet access for those unfamiliar or uncomfortable with traditional computers. Whether these appliances are adequate for educational uses has not been explored. This paper reports on two sets of studies of subject-computer interactions aimed at understanding factors that affect the acceptance and use of educational resources delivered by computer.

METHODS

Platform Analysis

Fifty medically unscreened subjects (34 women,
36 percent of total group between 61 and 70 years of age) were recruited from the Volunteer Program of the University of Iowa Hospitals and Clinics. Subjects evaluated the Apple iMac and Sony WebTV for a number of user characteristics, including searching, navigating, scrolling, e-mail, print size and clarity, image clarity, and screen color and brightness. All subjects evaluated both devices, and subjects were randomized to start with either the iMac or the WebTV. After evaluating the features of both, subjects indicated a preference for either one or the other or no preference.

Diabetes Education Study

Thirty adult patients with diabetes (15 women, group mean age 51), involved in a study of the clinical impact of Internet access (access to computer, Internet, training, support, and specialized diabetes education Web site) on diabetes glycemic control in a rural setting, underwent preintervention and postintervention (computer and Internet access) questionnaires to assess baseline characteristics and the impact of enhanced Internet access on perceptions of diabetes knowledge and control and use of information resources.

RESULTS

Platform Analysis

As a group, the volunteer subjects were fairly frequent users of computers and Internet access, with 70 percent using a computer more than
10 times per month and 54 percent using the Internet more than 10 times per month; 56 percent described themselves as being “very comfortable” using a computer. The iMac had a statistically (chi-squared) higher preference in the following categories: searching (P=0.04); print clarity

(P<0.001), clarity of pictures (P<0.001), clarity of images (P<0.001), screen color (P<0.05), and screen brightness (P<0.001). There were no statistically significant preferences noted in the following task types: navigation, scrolling, e-mail, and print size. Although there was no statistically detectable effect related to order of device evaluation, there was a strong statistical relationship between preference and frequency of computer use prior to the study. Reported use of the computer of more than 10 times per month was significantly related (P<0.05) to preference in all but the following areas: scrolling, e-mail, and print size.

Diabetes Education Study

Preintervention and postintervention results were available for 27 patients. As a group, the diabetes patients were infrequent users of computers. On average, computer use and Internet access occurred less than five times per month. Few patients had used the Internet to access general health or diabetes information. At baseline, patients obtained diabetes information from their physicians (90 percent), nonphysician providers (56 percent), friends/families (44 percent), or the Internet (26 percent).

After 3 months of Internet access, use of a specially designed diabetes Web site, and appropriate training and technical support, the patients perceived their diabetes to be better controlled (1 to 3 on a self-assessment scale, mean 2.0 before and 2.4 after). On a 1-to-5 scale (5=very useful), subjects ranked features of the diabetes Web site in the following way: content (4.14), access to site (4.04), ease of use (4.0), access to e-mail (3.77), access to suggested links (3.74), technical support (3.55), and access to threaded discussion and forum (3.20).

Patient assessment of the impact of computer and Internet access on information-seeking practices is summarized in Table 1.

Table 1. Patient Assessment of Impact of Computer and Internet Access on Information-Seeking Practices

Use	Increased	Decreased	No Change	No Response
Computer	67%	4%	26%	4%
Web	70%	0%	19%	11%
Forum	26%	4%	52%	19%

CONCLUSIONS

User perceptions of ease of use and effectiveness will play a role in the growth of the Internet for the education and management of patients with complex problems such as diabetes. Not all devices used to access the Internet are perceived as equivalent, and the differences may have important implications for their use in health care settings. Internet appliances appear to be adequate for basic text and e-mail functions but may lack sufficient resolution and graphical quality for other educational functions, especially for more experienced computer users. Many patients have relatively little experience with computers and Internet access but—given training, tools, and access—find these resources valuable and incorporate them into information-seeking about their disease.

ACKNOWLEDGMENT

This project has been funded with Federal funds from the National Library of Medicine under Contract No. N01-LM-6-3548.